PB88-199781

Pesticide Fact Sheet Number 151
Dihydrogen Sulfate

(U.S.) Environmental Protection Agency
Washington, DC

Dec 87

U.S. Department of Commerce
National Technical Information Service
NTIS

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO.	2.	3. PB88-199781

4. Title and Subtitle

EPA Pesticide Fact Sheets - Monocarbamide Dihydrogen Sulfate No. 151

5. Report Date 12/30/87

6.

7. Author(s)

EPA, Office of Pesticide Programs, Registration Division

8. Performing Organization Rept. No. 540/FS-88-058

9. Performing Organization Name and Address

U.S. Environmental Protection Agency
Office of Pesticide Programs
Registration Division (TS-767C)
401 M Street, SW
Washington, D.C. 20460

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.

(C)

(G)

12. Sponsoring Organization Name and Address

Same as #9

13. Type of Report & Period Covered

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

This document contains up-to-date chemical information, including a summary of the Agency's regulatory position and rationale, on a specific pesticide or group of pesticides. A Fact Sheet is issued after one of the the following actions has occurred.

1. Issuance or reissuance of a registration standard,
2. Issuance of each special review document,
3. Registration of a significantly changed use pattern,
4. Registration of a new chemical, or
5. An immediate need for information to resolve controversial issues relating to a specific chemical or use pattern.

17. Document Analysis a. Descriptors

Pesticides, regulations, Chemical Information Fact Sheet, Use Patterns, science findings.

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

REPRODUCED BY
U.S. DEPARTMENT OF COMMERCE
National Technical Information Service
SPRINGFIELD, VA. 22161

18. Availability Statement:	19. Security Class (This Report)	21. No. of Pages
Publicly Available	Unclassified	7
	20. Security Class (This Page) Unclassified	22. Price

United States
Environmental Protection
Agency

Office of Pesticides and Toxic Substances
Office of Pesticide Programs (TS-766C)
Washington, DC 20460

EPA

Pesticide Fact Sheet

Name of Chemical: MONOCARBAMIDE DIHYDROGEN SULFATE
Reason for Issuance: NEW CHEMICAL REGISTRATION
Date Issued: DEC 30 1987
Fact Sheet Number: 151

1. Description of Chemical:

Chemical Name: Monocarbamide dihydrogen sulfate

Other Name: Monourea sulfuric acid adduct

Trade Name: ENQUIK

OPP Internal Control Number: 078001

Year of Initial Registration: 1987

Pesticide Type: Herbicide/Desiccant

U.S. and Foreign Producers: Union Chemicals Division, Unocal Corp.

2. Use patterns and formulations:

Application sites: Herbicide uses include; Onions (green & dry bulb), leeks, shallots, spring onions, garlic, peanuts, peas, lentils, dry beans, garbanzos and grass seed. Desiccant uses include; dry beans, peas, lentils, peppermint and potato vines.

Types of formulations: liquid, 81.6% active ingredient

Types and methods of application: Applied postemergence to crops and weeds as a contact pesticide. Diluted with water and applied as a spray for broadcast, directed or shield spray treatments, using ground equipment. A wetting agent or non-ionic surfactant may be added.

Application rates: 20 to 309 lbs. a.i./A, depending upon application site

Usual carriers: water

3. Science findings:

Summary science statement:

Acute toxicology data indicate that the chemical is extremely caustic and corrosive. The appropriate toxicity category is I (DANGER), based on primary eye and skin irritation studies. Chronic toxicology and environmental fate data requirements are waived. Avian dietary studies indicate that the formulated product is practically nontoxic to mallard ducks and bobwhite quail. Diluted monocarbamide dihydrogen sulfate is less hazardous to wildlife than the undiluted chemical. Application is restricted to use of the diluted chemical only. Potential hazard to fish and wildlife including endangered species is minimized due to label restrictions against aerial application and limiting use to the following states; Alabama, Georgia, Idaho, Michigan, Oregon and Washington.

Chemical characteristics:

Physical state:	Viscous liquid
Color:	Colorless
Odor:	Odorless
Density:	13.14 pounds per gallon
Miscibility:	Limited miscibility in polar organic solvents. Not miscible with hydrocarbons and lipids.
Vapor pressure:	Negligible up to decomposition temperature of 80°C.
Crystallization point:	2°C
pH:	1 (aqueous solution)
Unusual handling characteristics:	Corrosive to nylon, cotton, leather, aluminum and copper alloy such as brass. Corrosive to skin and eyes. Explosively decomposes above 160°F. Do not mix with nitrogen fertilizers as explosive mixtures may result.

Toxicology characteristics:

Acute toxicology results:

Acute oral toxicity (rat): 1,200 mg/kg (male)
350 mg/kg (female)
Toxicity category II

Acute dermal toxicity (rabbit): greater than 2 g/kg. Study was terminated at 48 hours because of extreme caustic action and dermal necrosis. Toxicity category was not determined.

Primary skin irritation (rabbit): Caustic on intact and abraded skin at 24 hours. Study was terminated at 24 hours after similar results were obtained with 1:4 v/v dilution with water. Toxicity category I

Primary eye irritation (rabbit): Severe corneal involvement, grade 4 chemosis of conjunctivae at 24 hours. Because of severity of reaction, study was terminated at 24 hours. Toxicity category I

Acute inhalation toxicity (rat): greater than 10.8 mg/l
Toxicity category III

Additional data not required on acute dermal and primary eye irritation studies, in accordance with EPA-540/9-82-025, October 1982, Pesticide Assessment Guidelines Subdivision (§81-2(a)(1)) and Subdivision F (§81-4(d)(2)), respectively.

Chronic toxicology results: Additional toxicology studies (including a three-generation reproduction study) were waived in accordance with provisions of 40 CFR 162.45 (c). Toxicological concerns over heavy metal impurities in the sulfuric acid, have been adequately resolved. Recycled (spent) sulfuric acid will not be used to manufacture the active ingredient.

Major routes of exposure: Mixers, loaders and applicators would be expected to receive the most exposure via skin contact and inhalation.

Physiological and biochemical behavioral characteristics:

Mechanism of pesticidal action: Monocarbamide dihydrogen sulfate is a contact herbicide and desiccant. The chemical disrupts cell membrane structures in a catalytic non-acid consumptive reaction. The rate of activity is dependent upon the amount of waxy cuticle present on the surface of treated plants. Plants with a significant wax coating are less susceptible to damage than others.

Environmental characteristics: The environmental fate of urea and sulfuric acid are well known from the literature. Environmental fate data requirements are waived.

Ecological characteristics:

Hazards to fish and wildlife:

Avian dietary toxicity (Mallard): greater than 5620 ppm (49% a.i.)

Avian dietary toxicity (Bobwhite): greater than 5620 ppm (49% a.i.)

Simulated avian field study: Results indicate that eye and foot damage may be pronounced for birds exposed to direct applications of undiluted monocarbamide dihydrogen sulfate. Application of a diluted solution caused some but much less damage.

Avian re-entry field study: Results indicate that birds that can escape during ground application are unlikely to be harmed if they enter treated fields after application.

pH study in ephemeral ponds and irrigation water: The study indicates that under most conditions the acidifying effect of ENQUIK will be temporary. Only shallow ponds receiving an over-spraying of ENQUIK would be affected by a lowering of pH.

Potential problems related to endangered species: Contamination of habitat areas is not likely to occur as a result of runoff, since the chemical, once it reaches the soil, is expected to be neutralized. Potential hazard may exist for those endangered species receiving a direct spraying of ENQUIK. However, geographical restrictions and a prohibition against aerial application should minimize any potential hazard to endangered species.

Tolerance assessments: Monocarbamide dihydrogen sulfate is exempted from the requirement of a tolerance when used as a herbicide or desiccant in or on all raw agricultural commodities (40 CFR 180.1084).

4. Summary of regulatory position and rationale:

Use, formulation, geographical restrictions: Pesticidal use is limited to the following states; Alabama, Georgia, Idaho, Michigan, Oregon and Washington. Aerial application is prohibited.

Unique label warning statements:

End-Use Product:

Physical or Chemical Hazards

"ENQUIK is corrosive to nylon, aluminum, and any copper alloy such as brass. Do not use pumps or fittings containing nylon, mild steel, aluminum, brass, leather, natural rubber or buna N. Non-nylon plastic and 316-L

stainless steel are recommended for application equipment. Diluted ENQUIK is more corrosive to steel than the concentrate. Do not allow ENQUIK to be heated above 160°F as explosive decomposition may occur. Do not weld equipment containing ENQUIK.

Do not mix with nitrogen fertilizers as explosive mixtures may result. Do not mix with other materials without specific authorization as hazardous combinations may result.

Clothing: ENQUIK can attack cotton, nylon, and leather clothing. If ENQUIK contacts clothing of this type, flush with plenty of water to minimize damage. Wear non-nylon plastic protective clothing."

Human Hazards

"Corrosive. Causes irreversible eye damage and burns to skin. Face shields or goggles must be worn. Wear suitable protective equipment to protect skin, such as synthetic rubber or non-nylon plastic apron, gloves, pants and boots. Wash after contact with skin. Shower at the end of the working day. Do not wear contaminated clothing. Avoid spray. Avoid breathing spray mist."

Environmental Hazards

"This product may be harmful to wildlife directly sprayed. Keep out of lakes, ponds and streams. Do not apply directly to water or wetlands. Do not contaminate water by cleaning of equipment or disposal of wastes. Do not apply near waters already damaged by acid pollution or in areas with soils of poor buffering capacity if important aquatic resources are adjacent."

5. Summary of major data gaps: None

6. Contact person at EPA:

Robert J. Taylor
Product Manager (25), (TS-767C)
Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460
(703) 557-1800

DISCLAIMER: The information presented in this Pesticide Fact Sheet is for informational purposes only and may not be used to fulfill data requirements for pesticide registration and reregistration.